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FOREST INSECT AND DISEASE CONDITIONS REPORT, 1970

For the States:

Delaware	Missouri
Illinois	Ohio
Indiana	Pennsylvania
Maryland	West Virginia

Delaware Forest Pest Control Field Office
USDA - Forest Service
Box 365, Delaware, Ohio 43015

CONDITIONS IN BRIEF

INSECTS - The heavy defoliation by oak leaf rollers continued to damage oak forests in Pennsylvania and West Virginia where they defoliated about 1.1 million acres of forested land. Most of the damage in Pennsylvania was caused by *Archips semiferanus* while in West Virginia the oak leaf tier and fruit-tree leaf roller caused most of the damage. Treatment of 2,400 acres is planned for Black Moshannon State Park in Pennsylvania next year.

The forest tent caterpillar caused moderate to heavy defoliation on 360,000 acres in two major outbreak areas. The largest defoliation area (250,000 acres) is situated on the Ohio River bottoms in West Virginia and Ohio. The second infestation is located on the Pennsylvania-Maryland border. Suppression of this pest is planned for 1,600 acres in Pennsylvania in 1971.

The southern pine beetle, usually considered a pest of trees in the southeastern United States, played havoc with loblolly stands in Maryland and Delaware this year. One salvage operation completed in September amounted to $85,000. worth of timber.

The Gypsy moth has now been found in all counties east of the Susquehanna River and several counties west of the river in Pennsylvania. Somerset County is the westernmost infested location in Pennsylvania. Surveys showed that 15,000 acres in Pennsylvania supported heavy populations this summer. Three thousand acres were treated in 1970 with Dylox and Sevin. Moths were trapped in scattered locations in Delaware and Maryland this year.

Brood $\overline{X}$ of the periodical cicada emerged on schedule and caused widespread damage over a number of states. The states having the most damage by the cicada were Pennsylvania, Maryland, West Virginia and Ohio.

Sawfly populations were generally lower except for the Virginia pine sawfly. Heavy defoliation to shortleaf and Virginia pine stands were reported from West Virginia, Ohio and Indiana.

DISEASES - Annosus root rot, which had appeared to be increasing at a geometric rate in 1966, continued at the low level of 1969 when it was estimated at less than 1/10 tree per acre. National Forest and Forest Pest Control personnel have agreed to maintain surveillance for this disease and arrange for surveys when appropriate.

(continued next page)

Oak wilt mortality continued at the same low rate in 1970 as in 1969 in Maryland, Pennsylvania and West Virginia. A survey conducted by Delaware Field Office personnel in 1970 in southeast Missouri showed an estimated mortality of one tree per square mile.

Anthracnose of sycamore is less evident this year because of weather conditions that are less favorable for spread and infection.

An increasing amount of air pollution damage is reported every year. This is because of increased consciousness of this type of injury as well as increased production of toxic gases by vehicles, power plants and factories. Christmas tree growers are particularly concerned. Many of them have their plantations near urban areas for access to the market and therefore are near sources of pollution.

I. HARDWOOD INSECTS

A. Defoliators

1. Oak leaf roller complex, mostly *Archips semiferanus*, Walker, *Croesia semipurpurana* (Kearfott) and *Archips argyrospilus* Walker.

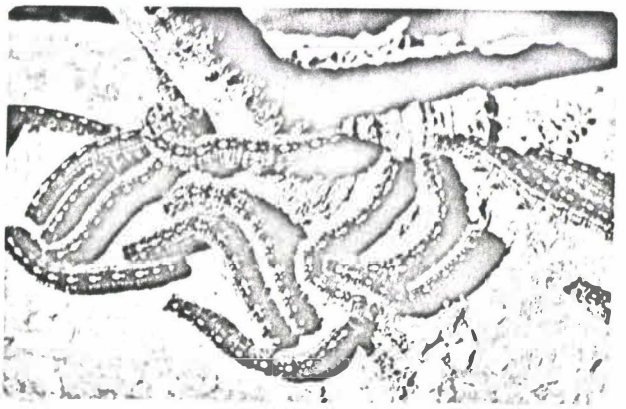
A massive outbreak of oak leaf rollers, primarily A. *semiferanus*, defoliated almost a million acres of forested land in Pennsylvania in 1970. The damage was confined to white and chestnut oak stands at higher elevations. Damage primarily due to *Archips* has accounted for 161,000 acres of oak mortality this year. About 46,000 acres of this is in the heavy mortality category (25-98%). A 2,400 acre suppression project is planned for Black Moshannon State Park in 1971.

The oak leaf tier (C. *semipurpurana*) and fruit-tree leaf roller (A. *argyrosphilus*) were responsible for defoliation of 100,000 acres of scarlet oak in West Virginia last year. A severe frost in May put further stress on the already infested trees. The frost did not affect the leaf rollers, however, so they were able to destroy the leaves the frost had left unharmed. Oak mortality is expected to occur in this area.

Oak leaf tier - one of the predominant species in the oak leaf roller complex which has been defoliating scarlet oak in West Virginia.

2. Forest tent caterpillar - *Malacosoma disstria* Hübner

An outbreak of this pest occurred over 250,000 acres of maple and oak along the Ohio River in West Virginia and Ohio in 1970. The insects' damage was further accentuated by a late spring frost. Damage by the forest tent caterpillar also occurred in 110,000 acres of oak and sugar maple along the Pennsylvania-Maryland border. Pennsylvania plans suppression project on 1,600 acres of Prince Gallitzin State Park.

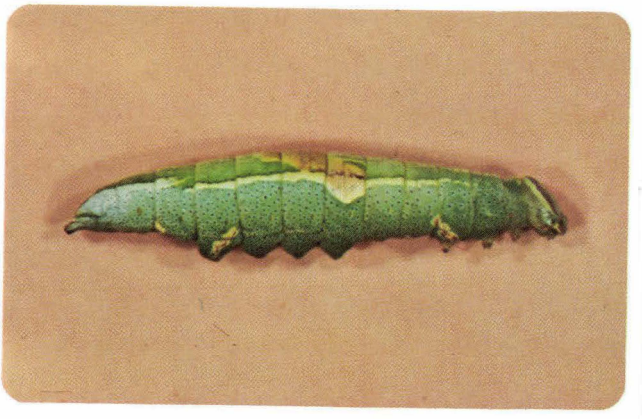


Larval stage of the forest tent caterpillar which accounted for 360,000 acres of defoliation this year.

3. Saddled prominent - *Heterocampa guttivitta* (Walker)

Infestations were restricted to 50,000 acres in northeastern Pennsylvania. Defoliation was only light to moderate in most cases, however. A drastic reduction in populations occurred as a result of a polyhedral virus disease this summer so the outbreak is now considered over. The insects' defoliation was primarily responsible for mortality of beech over 25,000 acres. Heavy mortality (over 30%) occurred over 5,000 acres. The monetary loss due to mortality was estimated to be over $600,000.

Saddled prominent larva - a serious defoliator of beech and maple in the northeast.



4. Gypsy moth - *Porthetria dispar* L.

In Pennsylvania the moth has now been found in all counties east of the Susquehanna River and in several counties west of the river. Somerset County is the westernmost infested location. An estimated 15,000 acres in the state supported high populations this year. Three thousand acres received two applications of insecticide last spring to help prevent the spread of the Gypsy moth. The first used Dylox, followed about ten days later with an application of Sevin.

Moths were trapped in scattered locations in Delaware and Maryland this year. As of October, Gypsy moths have not been recovered from any of the 3,000 traps placed in West Virginia.

5. Variable oak leaf caterpillar - *Heterocampa manteo* Dbldy.

This pest was a problem on oaks in central and southeastern Missouri. In association with the variable cak leaf caterpillar were the pale tussock moth, *Halisidota tessellaris* A.E.S., and the walkingstick, *Diapheromera femorata* Say. Populations are expected to be up in 1971.

Larva of the variable oak leaf caterpillar - a common defoliator of hardwood forests.

6. Orange-striped oakworm - *Anisota senatoria* A.E.S.

A localized infestation of this pest occurred at George O. White State Nursery in Missouri. The heavy feeding necessitated spraying with Sevin. Populations are expected to be higher in 1971.

Orange-striped oakworm larva - infestations of this pest are usually quite localized.

7. Eastern tent caterpillar - *Malacosoma americiana* (F.)

Populations of the eastern tent caterpillar were generally lower than they were in 1969 with the exception of Missouri and Pennsylvania. Defoliation in Missouri was exceptionally heavy on black cherry and other *Prunus* spp., in the St. Louis area and also in southern Missouri. Populations are expected to be high in Missouri in 1971. Pennsylvania reports the southern half of the state experienced a heavy outbreak.

Eastern tent caterpillars and nests - one of the most important pests of ornamental cherry and other *Prunus* spp. in the east.

8. Fall webworm - *Hyphantria cunea* Drury

Heavy defoliation is again reported in the southern portion of Ohio. West Virginia reports populations are up again in the northwestern part of the state. In Missouri populations were below 1969 levels, although numerous webs could be seen in the southwest portion of the state.

Unsightly webbing of the fall webworm which reduces the esthetic value of our forests.

B. Degraders

Hardwood borers - the carpenter worm, *Prionoxystus robiniae* (Peck) and the red oak borer *Enaphalodes rufulus* (Haldeman)

These borers continue to degrade oaks throughout the northeastern United States. A study recently conducted in Missouri revealed that the living tree hardwood borer complex is causing nearly one-half million dollar loss annually to red and black oaks in that state. In the same study, the carpenter worm accounted for 60% of the total borer damage.

Larval of the carpenter worm, a serious degrader of oak.

C. Other Hardwood Degrader

1. Periodical cicada - *Magicicada spetendecim* (L.)

After spending 17 years in the ground, brood X made its scheduled appearance in many states this year. The states which received the heaviest damage were Maryland, Pennsylvania, Ohio and West Virginia.

The adult female of the periodical cicada depositing her eggs.

II. CONIFER DEFOLIATORS

1. Virginia pine sawfly - *Neodiprion pratti pratti* (Dyar)

The upsurge of Virginia pine sawfly populations continued in West Virginia, Ohio and Indiana this year. West Virginia personnel report that twelve new counties were found infested with this sawfly. Indiana reported heavy defoliation to 5,000 acres of shortleaf pine plantations scattered throughout the southeastern portion of the state.

Virginia pine sawfly larva - an important defoliator of shortleaf and Virginia pine.

2. Larch sawfly - *Pristiphora erichsonii* (Hartig)

Substantial larch defoliation has been reported from strip mine plantations in Pennsylvania and Maryland this year. Although populations are still high, Pennsylvania reports the amount of defoliation decreased to moderate degrees.

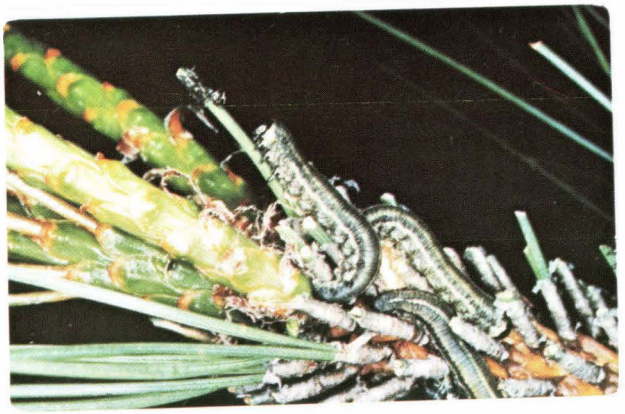
Larch sawfly larva - a persistent pest of larch in the northeast.

3. Loblolly pine sawfly - *Neodiprion taedae linearis* Ross

Levels of this pest are reported on the increase in Missouri and Illinois. In Missouri defoliation was at a high peak this year with the heaviest infestations occurring in the southeastern portion of the state. Illinois had scattered reports from the southern part of the state.

4. European pine sawfly - *Neodiprion sertifer* (Geoffroy)

Populations of this pest were prevalent again in Missouri, Illinois and Ohio. In Illinois, larger populations occurred in plantations in the northwestern portion of the state.



European pine sawfly larva - a continuous problem to Christmas tree producers.

5. Bagworm - *Thyridopteryx ephemeraeformis* (Haworth)

Damage to ornamental and plantation conifers was reported in Ohio and Illinois this year. Christmas tree owners are advised not to have cypress, larch or redcedar (highly favored hosts for bagworms) adjacent to their plantations.

Protective bags of the bagworm - an ornamental pest of redcedar, white pine and many other tree species.

6. Spruce budworm - *Choristoneura fumiferana* (Clements)

The spruce budworm, usually considered a pest of only balsam and spruce, was found in 1969 defoliating a 200-acre hemlock stand in Pennsylvania. In 1970, this pest was found over a wide area of eastern portion of the state causing heavy defoliation and decline of hemlock.

No suppression action is anticipated for this pest.

III. CONIFER DEGRADERS

1. Tip and shoot borers - *Rhyacionia frustrana* Comstock (Nantucket pine tip moth) and *Rhycionia buoliana* (Schiffermüller) (European pine shoot moth).

These pests continued to be prevalent and of concern to Christmas tree growers in Illinois and Missouri. The Nantucket pine tip moth poses a particular problem because it may have 2-3 generations per year. Continued high populations are expected in these states in 1971.

Larva and damage of Nantucket pine tip moth (left) and European pine shoot moth (right) - a perpetual problem for Christmas tree growers.

2. White pine weevil - *Pissodes strobi* (Peck)

All forest districts in Pennsylvania reported substantial increases in the amount of weevil damage in 1970. Moderate to heavy infestations are expected again in 1971.

Terminal leader of white pine damaged by the white pine weevil.

IV. OTHER CONIFER INSECTS

1. Southern pine beetle - *Dendroctonus frontalis*, Zimm.

The southern pine beetle, usually considered a pest of trees in the southeastern United States, played havoc with loblolly stands in Maryland and Delaware this year. A survey done in August placed tree loss at over twelve trees per thousand acres of host type in Maryland. Since August, beetle conditions have worsened due to dry weather and unusually warm temperatures. One salvage operation completed in September amounted to $85,000. worth of timber.

2. Black turpentine beetle - *Dendroctonus terebrans* (Oliv.)

Scattered small infestations are reported from Missouri. Infestations could be found wherever a timber sale occurred. Trees were salvaged where economically feasible.

V. DISEASES

A. Root Diseases

1. Annosus root rot, caused by *Fomes annosus* (Fr.) Cke.

No reports of new infection centers larger than a few trees were received from any of the eight states. A few white and red pines dying from this disease were found in southern Ohio. Stump treatments which had been recommended last year have been discontinued in Ohio. Missouri and Indiana report infection levels that are similar to the low 1961 levels. Surveillance for annosus root rot continues on federal, state, and private lands and surveys will be conducted as determined jointly by resource managers and Forest Pest Control personnel. Stump treatments will be limited to high use areas.

2. White pine root decline, caused by *Verticicladiella procera* Kendrick

This disease was identified in central, southern and southwestern Ohio. No evidence of increase was found in any state.

B. Wilts

1. Oak wilt, caused by *Ceratocystis fagacearum* (Bretz) Hunt

In Pennsylvania, on 4,000 square miles that received aerial coverage, about 417 oak wilt infected trees were found and 186 centers were treated. Bedford, Franklin, Fulton, Perry, and Huntingdon Counties in southcentral Pennsylvania were again the most heavily infested counties.

This year 3,105 oak wilt infected trees were found and treated in the West Virginia Department of Agriculture survey, approximately the same as in FY 1969. In Missouri, the heaviest concentration of oak wilt continued to be in Reynolds, Dent, and Shannon Counties southeast of Salem.

A combined visual-aerial survey with sketch mapping and color aerial photographic survey of southeastern Missouri for oak wilt was conducted in the summer of 1970 and incidence was estimated at about one tree per square mile.

Oak wilt was identified in samples from Garrett, Allegheny, and Washington Counties in Maryland. There was a small increase over previous years that may be due to an increased surveillance effort.

2. Dutch elm disease, caused by *Ceratocystis ulmi* (Buism.) C. Moreau

The use of DDT for bark beetle control is being severely curtailed and where spraying is done, methoxychlor is the insecticide employed. In Pennsylvania, tree fertilization and sanitation programs are being tried instead of spraying. The use of systemic fungicides is not yet successful. In the northern panhandle of West Virginia, infection centers 4-5 acres in size were observed.

3. Verticillium wilt of maples, caused by *Verticillium albo-atrum* Reinke and Berth

An increasing number of reports of this disease have been received in Pennsylvania.

C. Leaf Diseases

1. Anthracnose on sycamore, oak and maple, caused by *Gnomonia veneta* (Sacc. & Speg.) Kleb., on hickory caused by *Gnomonia caryae* Wolf.

Because of drier conditions, severity of anthracnose on sycamore was less than in 1969 in Ohio and Pennsylvania. The disease was relatively heavy on hickory in central Pennsylvania, however.

2. Needle casts and blights, caused by *Hypoderma lethale* Dearn., other *Hypoderma* species, *Elytroderma* spp., *Lophoderma* spp. and *Dothistroma pini* Hulb.

Needle cast was reported on pitch pine in central Pennsylvania. Needle blight was identified on specimens from nothern and southern Ohio. These needle diseases are found throughout the area every year and are not always reported.

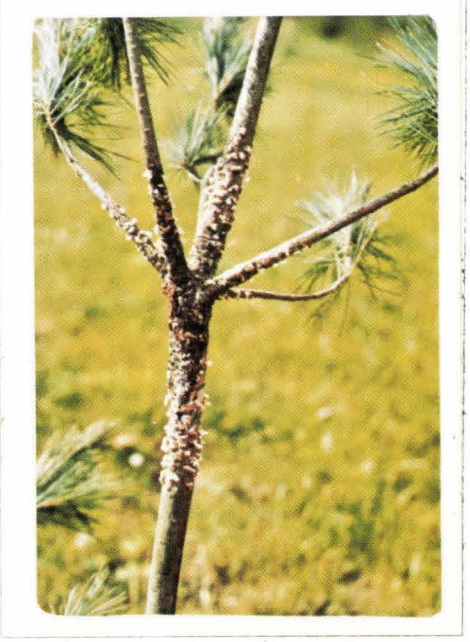
3. Needle rusts, caused by *Coleosporium* spp.

Like needle blights, the rusts occur to some extent every year. In Missouri, rusts were frequently found on shortleaf pine due to the wet spring.

D. Cankers

1. White pine blister rust, caused by *Cronartium ribicola* Fischer.

No new areas of infection were reported in Pennsylvania. There is little change in other states. The evaluation of Ribes eradication in Maryland, Pennsylvania and West Virginia is nearly complete.



2. Beech scale - Nectria canker, caused by a combination of *Cryptococcus fagi* (Baer.) and *Nectria coccinae* var. *faginata* Lahman, Watson and Ayers.

A survey by the Pennsylvania Department of Forests and Waters showed that this complex is concentrated in the northeast corner of Pennsylvania and decreases in incidence toward Scranton, Pa. There is no indication that the complex exists in other states in the Delaware Field Office area.

E. Air Pollution, caused by toxic gases.

The most common sources of damage to plants from air contaminants are ozone, sulfur dioxide, and oxides of nitrogen which are modified by the impact of sunlight (smog or peroxyacyl nitrates). Ozone and sulfur dioxide can cause stunting of white pine, commonly called "chlorotic dwarf."

These pollutants, as well as several less common ones (fluorides, aldehydes, etc.) can cause injury and death to foliage.

A report of damage to red and black oak, hickory and shortleaf pine in the vicinity of a lead smelter southeast of Salem, Mo., was investigated this year. Approximately 2,000 acres were involved. Damage appeared as indiscriminately located blotches on broad-leaved trees or reddened needles. A monitoring program for oxidants and sulfur dioxide, the chief pollutants, was initiated by Forest Pest Control and Clark National Forest personnel, Missouri Lead Operating Company, and the University of Missouri.

In West Virginia a "tip blight" of white pine in the southeast was traced to ozone produced in electrical storms.

A cooperative survey for air pollution damage was conducted by Pennsylvania Department of Forests and Waters and the Center of Environmental Studies at State College, Pa. Losses in commercial forest timber of $39,000., in Christmas trees of $141,000. and spoil bank and non-commercial timber of $113,000. were reported.

In addition to damage reported as air pollution damage, much "physiological" injury is caused by air pollution.

F. Other Diseases

Damage to ornamental and shade trees due to compaction, root disturbance, equipment injury and herbicide injury is so common that it is not often reported or it is ascribed to organic diseases. One case of toxicity to hickory from animal wastes was seen.

A bacterium causing infection of black walnut husks, which penetrates the nut and prevents germination, was isolated from the nuts and fits the description of *Xanthomonas juglandis* Pierce. This organism attacks Persian walnut and causes the same symptoms in that species.